



SEQUENCE LISTING

<110> Cancer Center
Kruh, Gary D.
Lee, Kun
Belinsky, Martin G.
Bain, Lisa J.

<120> MRP-Related ABC Transporter Encoding
Nucleic Acids and Methods of Use Thereof

<130> FCCC 98-02

<140> 09/647,140

<141> 2001-05-21

<150> PCT/US99/06644

<151> 1999-03-26

<150> 60/079,759

<151> 1998-03-27

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| Met | Lys | Asp | Ile | Asp | Ile | Gly | Lys | Glu | Tyr | Ile | Ile | Pro | Ser | Pro | Gly | 1 | 5 | 10 | 15 |
| Tyr | Arg | Ser | Val | Arg | Glu | Arg | Thr | Ser | Thr | Ser | Gly | Thr | His | Arg | Asp | 20 | 25 | 30 | |
| Arg | Glu | Asp | Ser | Lys | Phe | Arg | Arg | Thr | Arg | Pro | Leu | Glu | Cys | Gln | Asp | 35 | 40 | 45 | |
| Ala | Leu | Glu | Thr | Ala | Ala | Arg | Ala | Glu | Gly | Leu | Ser | Leu | Asp | Ala | Ser | 50 | 55 | 60 | |
| Met | His | Ser | Gln | Leu | Arg | Ile | Leu | Asp | Glu | Glu | His | Pro | Lys | Gly | Lys | 65 | 70 | 75 | 80 |
| Tyr | His | His | Gly | Leu | Ser | Ala | Leu | Lys | Pro | Ile | Arg | Thr | Thr | Ser | Lys | 85 | 90 | 95 | |
| His | Gln | His | Pro | Val | Asp | Asn | Ala | Gly | Leu | Phe | Ser | Cys | Met | Thr | Phe | 100 | 105 | 110 | |
| Ser | Trp | Leu | Ser | Ser | Leu | Ala | Arg | Val | Ala | His | Lys | Lys | Gly | Glu | Leu | 115 | 120 | 125 | |
| Ser | Met | Glu | Asp | Val | Trp | Ser | Leu | Ser | Lys | His | Glu | Ser | Ser | Asp | Val | 130 | 135 | 140 | |
| Asn | Cys | Arg | Arg | Leu | Glu | Arg | Leu | Trp | Gln | Glu | Glu | Leu | Asn | Glu | Val | 145 | 150 | 155 | 160 |
| Gly | Pro | Asp | Ala | Ala | Ser | Leu | Arg | Arg | Val | Val | Trp | Ile | Phe | Cys | Arg | 165 | 170 | 175 | |
| Thr | Arg | Leu | Ile | Leu | Ser | Ile | Val | Cys | Leu | Met | Ile | Thr | Gln | Leu | Ala | 180 | 185 | 190 | |
| Gly | Phe | Ser | Gly | Pro | Ala | Phe | Met | Val | Lys | His | Leu | Leu | Glu | Tyr | Thr | 195 | 200 | 205 | |
| Gln | Ala | Thr | Glu | Ser | Asn | Leu | Gln | Tyr | Ser | Leu | Leu | Val | Leu | Gly | | 210 | 215 | 220 | |
| Leu | Leu | Leu | Thr | Glu | Ile | Val | Arg | Ser | Trp | Ser | Leu | Ala | Leu | Thr | Trp | 225 | 230 | 235 | 240 |
| Ala | Leu | Asn | Tyr | Arg | Thr | Gly | Val | Arg | Leu | Arg | Gly | Ala | Ile | Leu | Thr | 245 | 250 | 255 | |
| Met | Ala | Phe | Lys | Lys | Ile | Leu | Lys | Leu | Lys | Asn | Ile | Lys | Glu | Lys | Ser | 260 | 265 | 270 | |
| Leu | Gly | Glu | Leu | Ile | Asn | Ile | Cys | Ser | Asn | Asp | Gly | Gln | Arg | Met | Phe | 275 | 280 | 285 | |
| Glu | Ala | Ala | Ala | Val | Gly | Ser | Leu | Leu | Ala | Gly | Gly | Pro | Val | Val | Ala | 290 | 295 | 300 | |
| Ile | Leu | Gly | Met | Ile | Tyr | Asn | Val | Ile | Ile | Leu | Gly | Pro | Thr | Gly | Phe | 305 | 310 | 315 | 320 |
| Leu | Gly | Ser | Ala | Val | Phe | Ile | Leu | Phe | Tyr | Pro | Ala | Met | Met | Phe | Ala | 325 | 330 | 335 | |
| Ser | Arg | Leu | Thr | Ala | Tyr | Phe | Arg | Arg | Lys | Cys | Val | Ala | Ala | Thr | Asp | 340 | 345 | 350 | |
| Glu | Arg | Val | Gln | Lys | Met | Asn | Glu | Val | Leu | Thr | Tyr | Ile | Lys | Phe | Ile | 355 | 360 | 365 | |
| Lys | Met | Tyr | Ala | Trp | Val | Lys | Ala | Phe | Ser | Gln | Ser | Val | Gln | Lys | Ile | 370 | 375 | 380 | |
| Arg | Glu | Glu | Glu | Arg | Arg | Ile | Leu | Glu | Lys | Ala | Gly | Tyr | Phe | Gln | Gly | 385 | 390 | 395 | 400 |
| Ile | Thr | Val | Gly | Val | Ala | Pro | Ile | Val | Val | Val | Ile | Ala | Ser | Val | Val | 405 | 410 | 415 | |
| Thr | Phe | Ser | Val | His | Met | Thr | Leu | Gly | Phe | Asp | Leu | Thr | Ala | Ala | Gln | 420 | 425 | 430 | |
| Ala | Phe | Thr | Val | Val | Thr | Val | Phe | Asn | Ser | Met | Thr | Phe | Ala | Leu | Lys | 435 | 440 | 445 | |
| Val | Thr | Pro | Phe | Ser | Val | Lys | Ser | Leu | Ser | Glu | Ala | Ser | Val | Ala | Val | 450 | 455 | 460 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Arg | Phe | Lys | Ser | Leu | Phe | Leu | Met | Glu | Glu | Val | His | Met | Ile | Lys |
| 465 | | | | | 470 | | | | | 475 | | | | | 480 |
| Asn | Lys | Pro | Ala | Ser | Pro | His | Ile | Lys | Ile | Glu | Met | Lys | Asn | Ala | Thr |
| | | | | 485 | | | | | 490 | | | | | 495 | |
| Leu | Ala | Trp | Asp | Ser | Ser | His | Ser | Ser | Ile | Gln | Asn | Ser | Pro | Lys | Leu |
| | | | 500 | | | | | 505 | | | | | 510 | | |
| Thr | Pro | Lys | Met | Lys | Lys | Asp | Lys | Arg | Ala | Ser | Arg | Gly | Lys | Lys | Glu |
| | | 515 | | | | | 520 | | | | | 525 | | | |
| Lys | Val | Arg | Gln | Leu | Gln | Arg | Thr | Glu | His | Gln | Ala | Val | Leu | Ala | Glu |
| | 530 | | | | | 535 | | | | | 540 | | | | |
| Gln | Lys | Gly | His | Leu | Leu | Leu | Asp | Ser | Asp | Glu | Arg | Pro | Ser | Pro | Glu |
| 545 | | | | | 550 | | | | | 555 | | | | | 560 |
| Glu | Glu | Glu | Gly | Lys | His | Ile | His | Leu | Gly | His | Leu | Arg | Leu | Gln | Arg |
| | | | | 565 | | | | | 570 | | | | | 575 | |
| Thr | Leu | His | Ser | Ile | Asp | Leu | Glu | Ile | Gln | Glu | Gly | Lys | Leu | Val | Gly |
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| Ile | Cys | Gly | Ser | Val | Gly | Ser | Gly | Lys | Thr | Ser | Leu | Ile | Ser | Ala | Ile |
| | | 595 | | | | | 600 | | | | | 605 | | | |
| Leu | Gly | Gln | Met | Thr | Leu | Leu | Glu | Gly | Ser | Ile | Ala | Ile | Ser | Gly | Thr |
| | 610 | | | | | 615 | | | | | 620 | | | | |
| Phe | Ala | Tyr | Val | Ala | Gln | Gln | Ala | Trp | Ile | Leu | Asn | Ala | Thr | Leu | Arg |
| 625 | | | | | 630 | | | | | 635 | | | | | 640 |
| Asp | Asn | Ile | Leu | Phe | Gly | Lys | Glu | Tyr | Asp | Glu | Glu | Arg | Tyr | Asn | Ser |
| | | | | 645 | | | | | 650 | | | | | 655 | |
| Val | Leu | Asn | Ser | Cys | Cys | Leu | Arg | Pro | Asp | Leu | Ala | Ile | Leu | Pro | Ser |
| | | | 660 | | | | | 665 | | | | | 670 | | |
| Ser | Asp | Leu | Thr | Glu | Ile | Gly | Glu | Arg | Gly | Ala | Asn | Leu | Ser | Gly | Gly |
| | | 675 | | | | | 680 | | | | | 685 | | | |
| Gln | Arg | Gln | Arg | Ile | Ser | Leu | Ala | Arg | Ala | Leu | Tyr | Ser | Asp | Arg | Ser |
| | 690 | | | | | 695 | | | | | 700 | | | | |
| Ile | Tyr | Ile | Leu | Asp | Asp | Pro | Leu | Ser | Ala | Leu | Asp | Ala | His | Val | Gly |
| 705 | | | | | 710 | | | | | 715 | | | | | 720 |
| Asn | His | Ile | Phe | Asn | Ser | Ala | Ile | Arg | Lys | His | Leu | Lys | Ser | Lys | Thr |
| | | | | 725 | | | | | 730 | | | | | 735 | |
| Val | Leu | Phe | Val | Thr | His | Gln | Leu | Gln | Tyr | Leu | Val | Asp | Cys | Asp | Glu |
| | | | 740 | | | | | 745 | | | | 750 | | | |
| Val | Ile | Phe | Met | Lys | Glu | Gly | Cys | Ile | Thr | Glu | Arg | Gly | Thr | His | Glu |
| | | 755 | | | | | 760 | | | | | 765 | | | |
| Glu | Leu | Met | Asn | Leu | Asn | Gly | Asp | Tyr | Ala | Thr | Ile | Phe | Asn | Asn | Leu |
| | 770 | | | | | 775 | | | | | 780 | | | | |
| Leu | Leu | Gly | Glu | Thr | Pro | Pro | Val | Glu | Ile | Asn | Ser | Lys | Lys | Glu | Thr |
| 785 | | | | | 790 | | | | | 795 | | | | | 800 |
| Ser | Gly | Ser | Gln | Lys | Lys | Ser | Gln | Asp | Lys | Gly | Pro | Lys | Thr | Gly | Ser |
| | | | | 805 | | | | | 810 | | | | | 815 | |
| Val | Lys | Lys | Glu | Lys | Ala | Val | Lys | Pro | Glu | Glu | Gly | Gln | Leu | Val | Gln |
| | | | 820 | | | | | 825 | | | | | 830 | | |
| Leu | Glu | Glu | Lys | Gly | Gln | Gly | Ser | Val | Pro | Trp | Ser | Val | Tyr | Gly | Val |
| | | 835 | | | | | 840 | | | | | 845 | | | |
| Tyr | Ile | Gln | Ala | Ala | Gly | Gly | Pro | Leu | Ala | Phe | Leu | Val | Ile | Met | Ala |
| | 850 | | | | | 855 | | | | | 860 | | | | |
| Leu | Phe | Met | Leu | Asn | Val | Gly | Ser | Thr | Ala | Phe | Ser | Thr | Trp | Trp | Leu |
| 865 | | | | | 870 | | | | | 875 | | | | | 880 |
| Ser | Tyr | Trp | Ile | Lys | Gln | Gly | Ser | Gly | Asn | Thr | Thr | Val | Thr | Arg | Gly |
| | | | | 885 | | | | | 890 | | | | | 895 | |
| Asn | Glu | Thr | Ser | Val | Ser | Asp | Ser | Met | Lys | Asp | Asn | Pro | His | Met | Gln |
| | | | 900 | | | | | 905 | | | | | 910 | | |
| Tyr | Tyr | Ala | Ser | Ile | Tyr | Ala | Leu | Ser | Met | Ala | Val | Met | Leu | Ile | Leu |
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| Lys | Ala | Ile | Arg | Gly | Val | Val | Phe | Val | Lys | Gly | Thr | Leu | Arg | Ala | Ser |
| | 930 | | | | | 935 | | | | | 940 | | | | |
| Ser | Arg | Leu | His | Asp | Glu | Leu | Phe | Arg | Arg | Ile | Leu | Arg | Ser | Pro | Met |
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| Lys | Phe | Phe | Asp | Thr | Pro | Thr | Gly | Arg | Ile | Leu | Asn | Arg | Phe | Ser | |
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 Phe Ile Gln Asn Val Ile Leu Val Phe Phe Cys Val Gly Met Ile Ala
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 Gly Val Phe Pro Trp Phe Leu Val Ala Val Gly Pro Leu Val Ile Leu
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 Ser Ile Gln Gly Leu Ala Thr Ile His Ala Tyr Asn Lys Gly Gln Glu
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 Thr Leu Ser Leu Glu Ala Pro Ala Arg Ile Lys Asn Lys Ala Pro Ser
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| ggtgccctgc | atctacctgt | gggtgcgccct | gccctgctac | ttgctctacc | tggggcacca | 180 |
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<211> 1503

<212> PRT

<213> Homo sapiens

<400> 8

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Thr Glu Pro Glu Pro Ala Ala Thr Ser Leu Leu Ser Leu Cys Phe Leu
20          25          30
Arg Thr Ala Gly Val Trp Val Pro Pro Met Tyr Leu Trp Val Leu Gly
35          40          45
Pro Ile Tyr Leu Leu Phe Ile His His His Gly Arg Gly Tyr Leu Arg
50          55          60
Met Ser Pro Leu Phe Lys Ala Lys Met Val Leu Gly Phe Ala Leu Ile
65          70          75          80

```

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Leu | Cys | Thr | Ser | Ser | Val | Ala | Val | Ala | Leu | Trp | Lys | Ile | Gln | Gln |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Gly | Thr | Pro | Glu | Ala | Pro | Glu | Phe | Leu | Ile | His | Pro | Thr | Val | Trp | Leu |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Thr | Thr | Met | Ser | Phe | Ala | Val | Phe | Leu | Ile | His | Thr | Glu | Arg | Lys | Lys |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Gly | Val | Gln | Ser | Ser | Gly | Val | Leu | Phe | Gly | Tyr | Trp | Leu | Leu | Cys | Phe |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Val | Leu | Pro | Ala | Thr | Asn | Ala | Ala | Gln | Gln | Ala | Ser | Gly | Ala | Gly | Phe |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Gln | Ser | Asp | Pro | Val | Arg | His | Leu | Ser | Thr | Tyr | Leu | Cys | Leu | Ser | Leu |
| | | | 165 | | | | | | 170 | | | | | 175 | |
| Val | Val | Ala | Gln | Phe | Val | Leu | Ser | Cys | Leu | Ala | Asp | Gln | Pro | Pro | Phe |
| | | 180 | | | | | | 185 | | | | | 190 | | |
| Phe | Pro | Glu | Asp | Pro | Gln | Gln | Ser | Asn | Pro | Cys | Pro | Glu | Thr | Gly | Ala |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Ala | Phe | Pro | Ser | Lys | Ala | Thr | Phe | Trp | Trp | Val | Ser | Gly | Leu | Val | Trp |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Arg | Gly | Tyr | Arg | Arg | Pro | Leu | Arg | Pro | Lys | Asp | Leu | Trp | Ser | Leu | Gly |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Arg | Glu | Asn | Ser | Ser | Glu | Glu | Leu | Val | Ser | Arg | Leu | Glu | Lys | Glu | Trp |
| | | | 245 | | | | | | 250 | | | | | 255 | |
| Met | Arg | Asn | Arg | Ser | Ala | Ala | Arg | Arg | His | Asn | Lys | Ala | Ile | Ala | Phe |
| | | 260 | | | | | | 265 | | | | | 270 | | |
| Lys | Arg | Lys | Gly | Gly | Ser | Gly | Met | Lys | Ala | Pro | Glu | Thr | Glu | Pro | Phe |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Leu | Arg | Gln | Glu | Gly | Ser | Gln | Trp | Arg | Pro | Leu | Leu | Lys | Ala | Ile | Trp |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Gln | Val | Phe | His | Ser | Thr | Phe | Leu | Leu | Gly | Thr | Leu | Ser | Leu | Ile | Ile |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Ser | Asp | Val | Phe | Arg | Phe | Thr | Val | Pro | Lys | Leu | Leu | Ser | Leu | Phe | Leu |
| | | | 325 | | | | | | 330 | | | | | 335 | |
| Glu | Phe | Ile | Gly | Asp | Pro | Lys | Pro | Pro | Ala | Trp | Lys | Gly | Tyr | Leu | Leu |
| | | 340 | | | | | | 345 | | | | | 350 | | |
| Ala | Val | Leu | Met | Phe | Leu | Ser | Ala | Cys | Leu | Gln | Thr | Leu | Phe | Glu | Gln |
| | | 355 | | | | | 360 | | | | | 365 | | | |
| Gln | Asn | Met | Tyr | Arg | Leu | Lys | Val | Pro | Gln | Met | Arg | Leu | Arg | Ser | Ala |
| | 370 | | | | | 375 | | | | | 380 | | | | |
| Ile | Thr | Gly | Leu | Val | Tyr | Arg | Lys | Val | Leu | Ala | Leu | Ser | Ser | Gly | Ser |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 |
| Arg | Lys | Ala | Ser | Ala | Val | Gly | Asp | Val | Val | Asn | Leu | Val | Ser | Val | Asp |
| | | | 405 | | | | | | 410 | | | | | 415 | |
| Val | Gln | Arg | Leu | Thr | Glu | Ser | Val | Leu | Tyr | Leu | Asn | Gly | Leu | Trp | Leu |
| | | | 420 | | | | | 425 | | | | | 430 | | |
| Pro | Leu | Val | Trp | Ile | Val | Val | Cys | Phe | Val | Tyr | Leu | Trp | Gln | Leu | Leu |
| | | 435 | | | | | 440 | | | | | 445 | | | |
| Gly | Pro | Ser | Ala | Leu | Thr | Ala | Ile | Ala | Val | Phe | Leu | Ser | Leu | Leu | Pro |
| | 450 | | | | | 455 | | | | 460 | | | | | |
| Leu | Asn | Phe | Phe | Ile | Ser | Lys | Lys | Arg | Asn | His | His | Gln | Glu | Glu | Gln |
| 465 | | | | | 470 | | | | | 475 | | | | | 480 |
| Met | Arg | Gln | Lys | Asp | Ser | Arg | Ala | Arg | Leu | Thr | Ser | Ser | Ile | Leu | Arg |
| | | | 485 | | | | | | 490 | | | | | 495 | |
| Asn | Ser | Lys | Thr | Ile | Lys | Phe | His | Gly | Trp | Glu | Gly | Ala | Phe | Leu | Asp |
| | | | 500 | | | | | 505 | | | | | 510 | | |
| Arg | Val | Leu | Gly | Ile | Arg | Gly | Gln | Glu | Leu | Gly | Ala | Leu | Arg | Thr | Ser |
| | | 515 | | | | | 520 | | | | | 525 | | | |
| Gly | Leu | Leu | Phe | Ser | Val | Ser | Leu | Val | Ser | Phe | Gln | Val | Ser | Thr | Phe |
| | 530 | | | | | 535 | | | | | 540 | | | | |
| Leu | Val | Ala | Leu | Val | Val | Phe | Ala | Val | His | Thr | Leu | Val | Ala | Glu | Asn |
| 545 | | | | | 550 | | | | | 555 | | | | | 560 |
| Ala | Met | Asn | Ala | Glu | Lys | Ala | Phe | Val | Thr | Leu | Thr | Val | Leu | Asn | Ile |
| | | | 565 | | | | | | 570 | | | | | 575 | |
| Leu | Asn | Lys | Ala | Gln | Ala | Phe | Leu | Pro | Phe | Ser | Ile | His | Ser | Leu | Val |
| | | | 580 | | | | | 585 | | | | | 590 | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Ala | Arg | Val | Ser | Phe | Asp | Arg | Leu | Val | Thr | Phe | Leu | Cys | Leu | Glu |
| | | 595 | | | | | 600 | | | | | 605 | | | |
| Glu | Val | Asp | Pro | Gly | Val | Val | Asp | Ser | Ser | Ser | Ser | Gly | Ser | Ala | Ala |
| | 610 | | | | | 615 | | | | | 620 | | | | |
| Gly | Lys | Asp | Cys | Ile | Thr | Ile | His | Ser | Ala | Thr | Phe | Ala | Trp | Ser | Gln |
| 625 | | | | | 630 | | | | | 635 | | | | | 640 |
| Glu | Ser | Pro | Pro | Cys | Leu | His | Arg | Ile | Asn | Leu | Thr | Val | Pro | Gln | Gly |
| | | | | 645 | | | | | 650 | | | | | 655 | |
| Cys | Leu | Leu | Ala | Val | Val | Gly | Pro | Val | Gly | Ala | Gly | Lys | Ser | Ser | Leu |
| | | | 660 | | | | | 665 | | | | | 670 | | |
| Leu | Ser | Ala | Leu | Leu | Gly | Glu | Leu | Ser | Lys | Val | Glu | Gly | Phe | Val | Ser |
| | | 675 | | | | | 680 | | | | | 685 | | | |
| Ile | Glu | Gly | Ala | Val | Ala | Tyr | Val | Pro | Gln | Glu | Ala | Trp | Val | Gln | Asn |
| | 690 | | | | | 695 | | | | | 700 | | | | |
| Thr | Ser | Val | Val | Glu | Asn | Val | Cys | Phe | Gly | Gln | Glu | Leu | Asp | Pro | Pro |
| 705 | | | | | 710 | | | | | 715 | | | | | 720 |
| Trp | Leu | Glu | Arg | Val | Leu | Glu | Ala | Cys | Ala | Leu | Gln | Pro | Asp | Val | Asp |
| | | | | 725 | | | | | 730 | | | | | 735 | |
| Ser | Phe | Pro | Glu | Gly | Ile | His | Thr | Ser | Ile | Gly | Glu | Gln | Gly | Met | Asn |
| | | | 740 | | | | 745 | | | | | | 750 | | |
| Leu | Ser | Gly | Gly | Gln | Lys | Gln | Arg | Leu | Ser | Leu | Ala | Arg | Ala | Val | Tyr |
| | | 755 | | | | | 760 | | | | | 765 | | | |
| Arg | Lys | Ala | Ala | Val | Tyr | Leu | Leu | Asp | Asp | Pro | Leu | Ala | Ala | Leu | Asp |
| | 770 | | | | | 775 | | | | | 780 | | | | |
| Ala | His | Val | Gly | Gln | His | Val | Phe | Asn | Gln | Val | Ile | Gly | Pro | Gly | Gly |
| 785 | | | | | 790 | | | | | 795 | | | | | 800 |
| Leu | Leu | Gln | Gly | Thr | Thr | Arg | Ile | Leu | Val | Thr | His | Ala | Leu | His | Ile |
| | | | | 805 | | | | | 810 | | | | | 815 | |
| Leu | Pro | Gln | Ala | Asp | Trp | Ile | Ile | Val | Leu | Ala | Asn | Gly | Ala | Ile | Ala |
| | | | 820 | | | | | 825 | | | | | 830 | | |
| Glu | Met | Gly | Ser | Tyr | Gln | Glu | Leu | Leu | Gln | Arg | Lys | Gly | Ala | Leu | Val |
| | | 835 | | | | | 840 | | | | | 845 | | | |
| Cys | Leu | Leu | Asp | Gln | Ala | Arg | Gln | Pro | Gly | Asp | Arg | Gly | Glu | Gly | Glu |
| | 850 | | | | | 855 | | | | | 860 | | | | |
| Thr | Glu | Pro | Gly | Thr | Ser | Thr | Lys | Asp | Pro | Arg | Gly | Thr | Ser | Ala | Gly |
| 865 | | | | | 870 | | | | | 875 | | | | | 880 |
| Arg | Arg | Pro | Glu | Leu | Arg | Arg | Glu | Arg | Ser | Ile | Lys | Ser | Val | Pro | Glu |
| | | | 885 | | | | | | 890 | | | | | 895 | |
| Lys | Asp | Arg | Thr | Thr | Ser | Glu | Ala | Gln | Thr | Glu | Val | Pro | Leu | Asp | Asp |
| | | | 900 | | | | | 905 | | | | | 910 | | |
| Pro | Asp | Arg | Ala | Gly | Trp | Pro | Ala | Gly | Lys | Asp | Ser | Ile | Gln | Tyr | Gly |
| | | 915 | | | | | 920 | | | | | 925 | | | |
| Arg | Val | Lys | Ala | Thr | Val | His | Leu | Ala | Tyr | Leu | Arg | Ala | Val | Gly | Thr |
| | 930 | | | | | 935 | | | | | 940 | | | | |
| Pro | Leu | | | | | | | | | | | | | | |

```

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          1125          1130          1135
Val Arg Ala Phe Arg Thr Gln Ala Pro Phe Val Ala Gln Asn Asn Ala
          1140          1145          1150
Arg Val Asp Glu Ser Gln Arg Ile Ser Phe Pro Arg Leu Val Ala Asp
          1155          1160          1165
Arg Trp Leu Ala Ala Asn Val Glu Leu Leu Gly Asn Gly Leu Val Phe
          1170          1175          1180
Ala Ala Ala Thr Cys Ala Val Leu Ser Lys Ala His Leu Ser Ala Gly
1185          1190          1195          1200
Leu Val Gly Phe Ser Val Ser Ala Ala Leu Gln Val Thr Gln Ala Leu
          1205          1210          1215
Gln Trp Val Val Arg Asn Trp Thr Asp Leu Glu Asn Ser Ile Val Ser
          1220          1225          1230
Val Glu Arg Met Gln Asp Tyr Ala Trp Thr Pro Lys Glu Ala Pro Trp
          1235          1240          1245
Arg Leu Pro Thr Cys Ala Ala Gln Pro Pro Trp Pro Gln Gly Gly Gln
          1250          1255          1260
Ile Glu Phe Arg Asp Phe Gly Leu Arg Tyr Arg Pro Glu Leu Pro Leu
1265          1270          1275          1280
Ala Val Gln Gly Val Ser Leu Lys Ile His Ala Gly Glu Lys Val Gly
          1285          1290          1295
Ile Val Gly Arg Thr Gly Ala Gly Lys Ser Ser Leu Ala Ser Gly Leu
          1300          1305          1310
Leu Arg Leu Gln Glu Ala Ala Glu Gly Gly Ile Trp Ile Asp Gly Val
          1315          1320          1325
Pro Ile Ala His Val Gly Leu His Thr Leu Arg Ser Arg Ile Ser Ile
          1330          1335          1340
Ile Pro Gln Asp Pro Ile Leu Phe Pro Gly Ser Leu Arg Met Asn Leu
1345          1350          1355          1360
Asp Leu Leu Gln Glu His Ser Asp Glu Ala Ile Trp Ala Ala Leu Glu
          1365          1370          1375
Thr Val Gln Leu Lys Ala Leu Val Ala Ser Leu Pro Gly Gln Leu Gln
          1380          1385          1390
Tyr Lys Cys Ala Asp Arg Gly Glu Asp Leu Ser Val Gly Gln Lys Gln
          1395          1400          1405
Leu Leu Cys Leu Ala Arg Ala Leu Leu Arg Lys Thr Gln Ile Leu Ile
          1410          1415          1420
Leu Asp Glu Ala Thr Ala Ala Val Asp Pro Gly Thr Glu Leu Gln Met
1425          1430          1435          1440
Gln Ala Met Leu Gly Ser Trp Phe Ala Gln Cys Thr Val Leu Leu Ile
          1445          1450          1455
Ala His Arg Leu Arg Ser Val Met Asp Cys Ala Arg Val Leu Val Met
          1460          1465          1470
Asp Lys Gly Gln Val Ala Glu Ser Gly Ser Pro Ala Gln Leu Leu Ala
          1475          1480          1485
Gln Lys Gly Leu Phe Tyr Arg Leu Ala Gln Glu Ser Gly Leu Val
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<210> 9
<211> 18
<212> DNA
<213> Artificial Sequence

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<220>
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<220>
<221> misc_feature
<222> (3)...(15)
<223> d = a, g or t

```

<220>
 <221> misc_feature
 <222> (18)...(18)
 <223> n = a, c, g or t

 <400> 9
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 <210> 10
 <211> 19
 <212> DNA
 <213> Artificial Sequence

 <220>
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 <400> 10
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 <210> 11
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 <210> 12
 <211> 20
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 <220>
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 <400> 12
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 <210> 13
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 <220>
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 <210> 14
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 <212> DNA
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20

<210> 15
<211> 19
<212> DNA
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<220>
<223> Sequence source:/note="synthetic construct"

<400> 15
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19

<210> 16
<211> 24
<212> DNA
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<220>
<221> misc_feature
<222> (4)...(19)
<223> n = a, c, g or t

<220>
<221> misc_feature
<222> (6)...(6)
<223> v = a, c or g

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<221> misc_feature
<222> (11)...(11)
<223> s = c or g

<220>
<221> misc_feature
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<223> w = a or t

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24

<210> 17
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<212> DNA
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 <223> y = c or t

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 <222> (20)...(20)
 <223> h = a, c or t

 <220>
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 <222> (23)...(29)
 <223> n = a, c, g or t

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29

<210> 18
 <211> 29
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Sequence source:/note="synthetic construct"

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 <222> (9)...(18)
 <223> n = a, c, g or t

<220>
 <221> misc_feature
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 <223> r = a or g

<220>
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 <223> d = a, g or t

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29